Weekly Updates (19/10/2023) – Krishna Tarun Saikonda

In my project, I've taken a proactive approach to better understand and analyze various driver behaviors within a simulated environment. To achieve this, I've created distinct vehicle types, each characterized by a unique set of parameters. By modifying these parameters, I'm able to investigate how changes in acceleration, deceleration, speed, and other attributes influence driver behavior, and consequently, the dynamics of traffic flow. This approach empowers me to simulate and examine different scenarios, allowing me to gain valuable insights into the intricacies of driver behavior and its impact on road safety and traffic efficiency. It's an essential step in my research to better comprehend the intricacies of driver actions and reactions, providing a foundation for potential enhancements in real-world traffic management and safety measures.

Vehicle Type Parameters:

Vehicle Type	Length	Car Follow Model	Sigma	Tau	Accel	Decel	Max Speed	Collision Min Gap Factor	Lane Change Model	
AggressiveDriver	N/A	EIDM	0.5	0.05	5.0	5.0	45.0	0.5	LC2013	
CautiousDriver	N/A	EIDM	0.5	0.5	1.0	2.0	30.0	0.5	LC2013	
EcoFriendlyDriver	N/A	EIDM	0.5	0.5	2.0	3.0	20.0	0.5	LC2013	
RecklessDriver	N/A	EIDM	0.5	0.07	4.0	6.0	50.0	0.5	LC2013	
DefensiveDriver	N/A	EIDM	0.5	0.5	1.5	2.5	30.0	0.5	LC2013	
HumanLikeDriver	N/A	EIDM	0.5	0.25	2.0	3.0	25.0	0.5	LC2013	
DeliveryTruck	7	EIDM	0.7	0.3	2.5	3.0	30.0	0.5	LC2013	
SchoolBus	7	EIDM	0.6	0.4	1.5	2.5	35.0	0.5	LC2013	

	Human LikeDriver	**AggressiveLane changing Driver**	**NoLanechanging Driver**	**Aggressive JunctionDriver**	**InexperiencedDriver**
Length	N/A	N/A	N/A	N/A	N/A
Car Follow Model	EIDM	EIDM	EIDM	EIDM	EIDM
Sigma	0.5	0.5	N/A	0.5	0.6
Tau	0.25	0.1	N/A	0.1	0.4
Accel	2.0	2.0	N/A	2.0	1.0
Decel	3.0	5.0	N/A	3.0	2.0
Max Speed	25.0	30.0	N/A	30.0	25.0
Collision Min Gap Factor	0.5	0.5	0.5	0.5	0.5
Lane Change Model	LC2013	LC2013	LC2013	N/A	LC2013
LC Accel Lat	N/A	6	6	N/A	N/A
LC Assertive	N/A	1	1	N/A	N/A

LC Pushy	N/A	1	1	N/A	N/A
LC Impatience	N/A	0.5	0.5	N/A	N/A
LC Sigma	N/A	0.7	0.7	N/A	N/A
LC Speed Gain	N/A	5	5	N/A	N/A
LC Strategic	N/A	0	-1	N/A	N/A
Impatience	N/A	N/A	N/A	0.50	N/A
jmSigmaMinor	N/A	N/A	N/A	1	N/A
jmIgnoreFoeSpeed	N/A	N/A	N/A	25	N/A
jmIgnoreFoeProb	N/A	N/A	N/A	0.5	N/A
jmTimegapMinor	N/A	N/A	N/A	0.3	N/A

	ElderlyDriver	**SportsCarDriver**	**Motorcycle**
Length	N/A	N/A	1.6
Car Follow Model	EIDM	EIDM	EIDM
Sigma	0.4	0.4	0.3
Tau	0.1	0.1	0.05
Accel	1.2	6.0	7.0
Decel	5.0	15.5	7.0
Max Speed	20.0	60.0	40.0
Collision Min Gap Factor	0.5	0.5	0.5
Lane Change Model	LC2013	LC2013	LC2013
LC Accel Lat	N/A	N/A	8
LC Assertive	N/A	1	1
LC Pushy	N/A	N/A	1
LC Impatience	N/A	N/A	0.5
LC Sigma	N/A	N/A	0.7
LC Speed Gain	N/A	N/A	5
LC Strategic	0	0	0.5
Impatience	N/A	N/A	N/A
jmSigmaMinor	N/A	1	N/A
jmIgnoreFoeSpeed	N/A	25	N/A
jmIgnoreFoeProb	N/A	0.5	N/A
jmTimegapMinor	N/A	0.3	N/A

Vehicle Type Distribution:

Vehicle Type	Probability
AggressiveDriver	0.10
CautiousDriver	0.20
EcoFriendlyDriver	0.10
RecklessDriver	0.20
DefensiveDriver	0.10
HumanLikeDriver	0.10
AggressiveLanechangingdriver	0.10
Aggressivejunctiondriver	0.05
InexperiencedDriver	0.05
DeliveryTruck	0.05
ElderlyDriver	0.05
SportsCarDriver	0.05
SchoolBus	0.05
Motorcycle	0.05

This table displays the vehicle types included in the distribution and their respective probabilities. It provides an overview of how often each type of driver will appear in the simulated environment, helping to create a realistic and diverse traffic scenario for your simulation. If you have any further questions or need additional information, please let me know.

Flow Attributes:

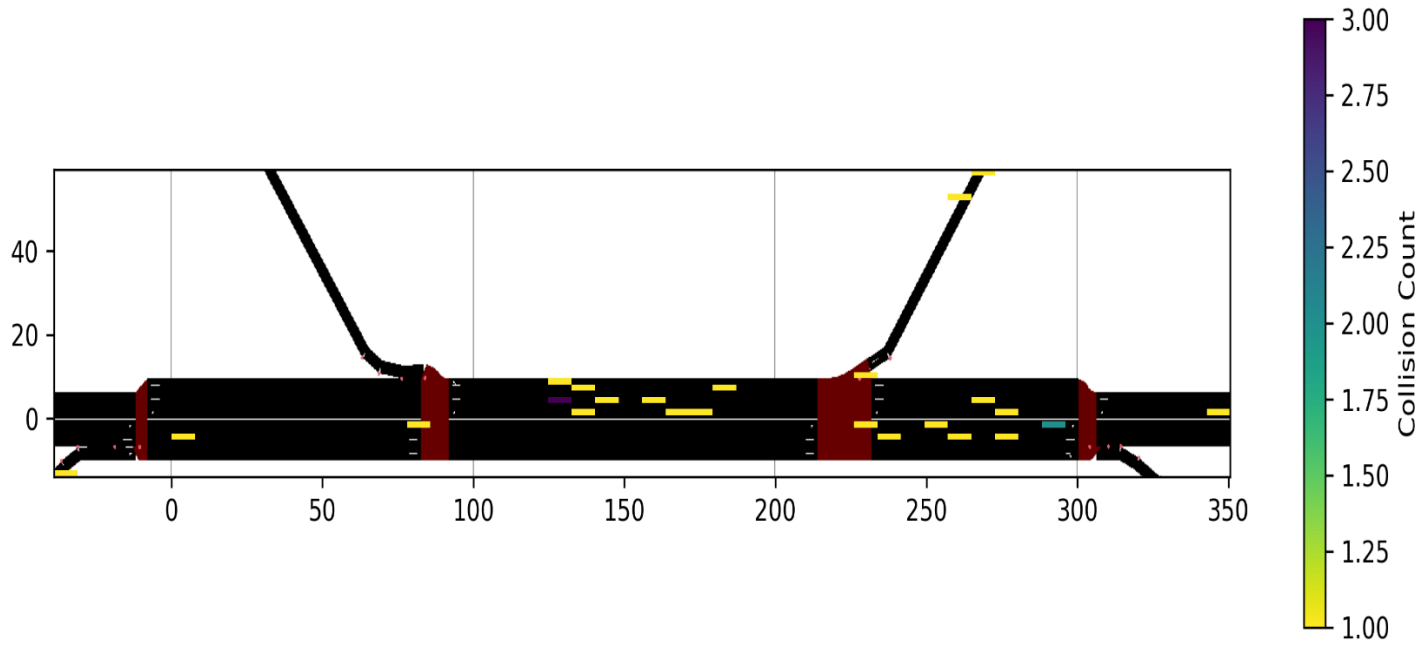
Parameter	f_0
Flow ID	f_0
Begin	0.00
From	E0
To	E2
End	600.00
Number	600
Depart Pos	random
Depart Lane	free
Depart Pos Lat	random_free
Arrival Pos	random
Arrival Lane	random
Type	typedist2

This table provides a clear overview of the parameters for the "f_0" flow, including its start and end times, origin and destination, the number of vehicles, and various other settings related to vehicle generation. If you have any further questions or need additional information, please feel free to ask.

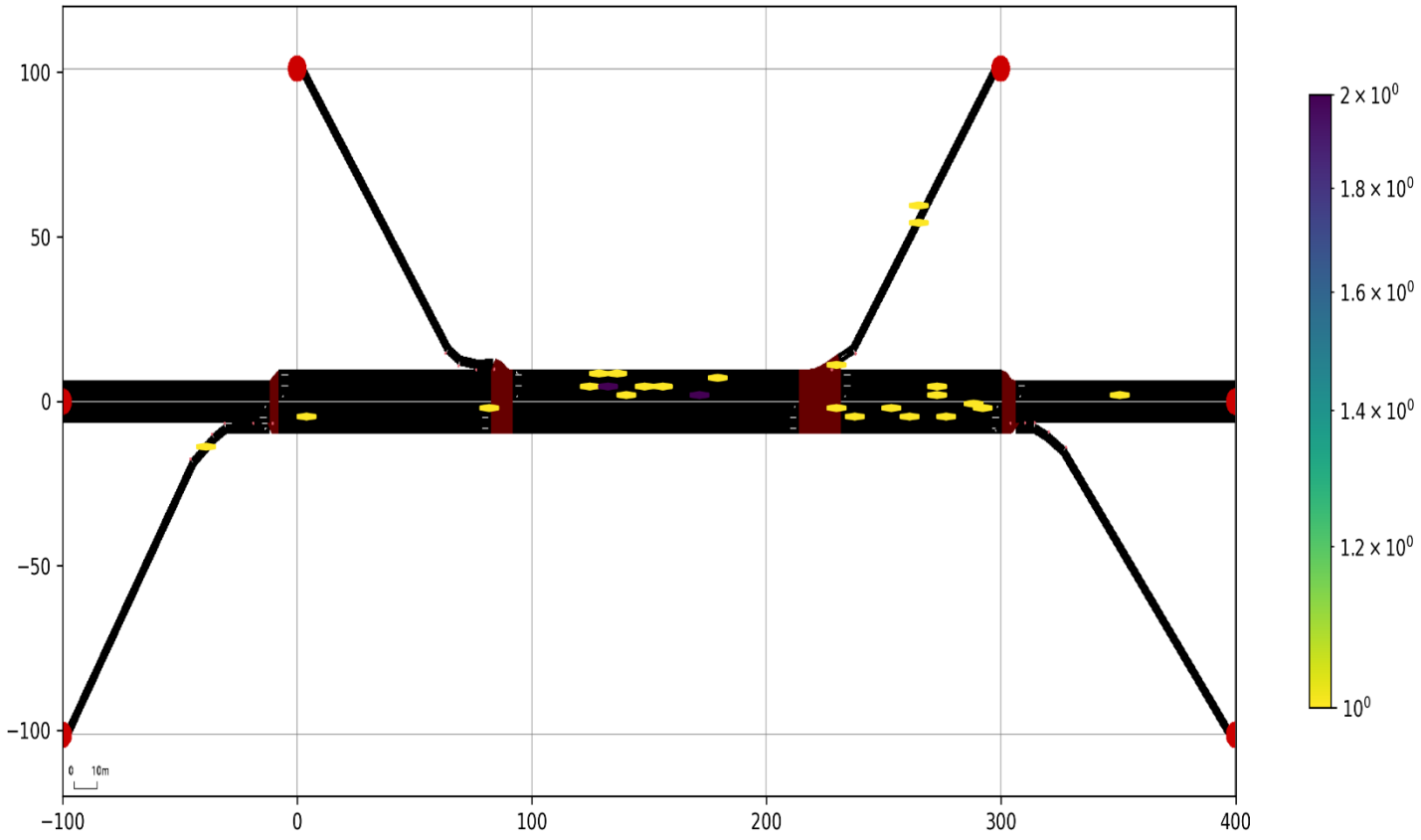
HeatMap of the collisions overlayed on the road network:

A "HeatMap of the collisions overlayed on the road network" is a visual representation used to depict the concentration or frequency of collisions that occur at various locations on a road network. This type of map is typically created by superimposing collision data onto a road map or network, with each collision contributing to the "heat" or intensity at its specific location. The brighter or more intense areas on the map represent places where collisions are more frequent or concentrated, while the cooler or less intense areas signify lower collision occurrences.

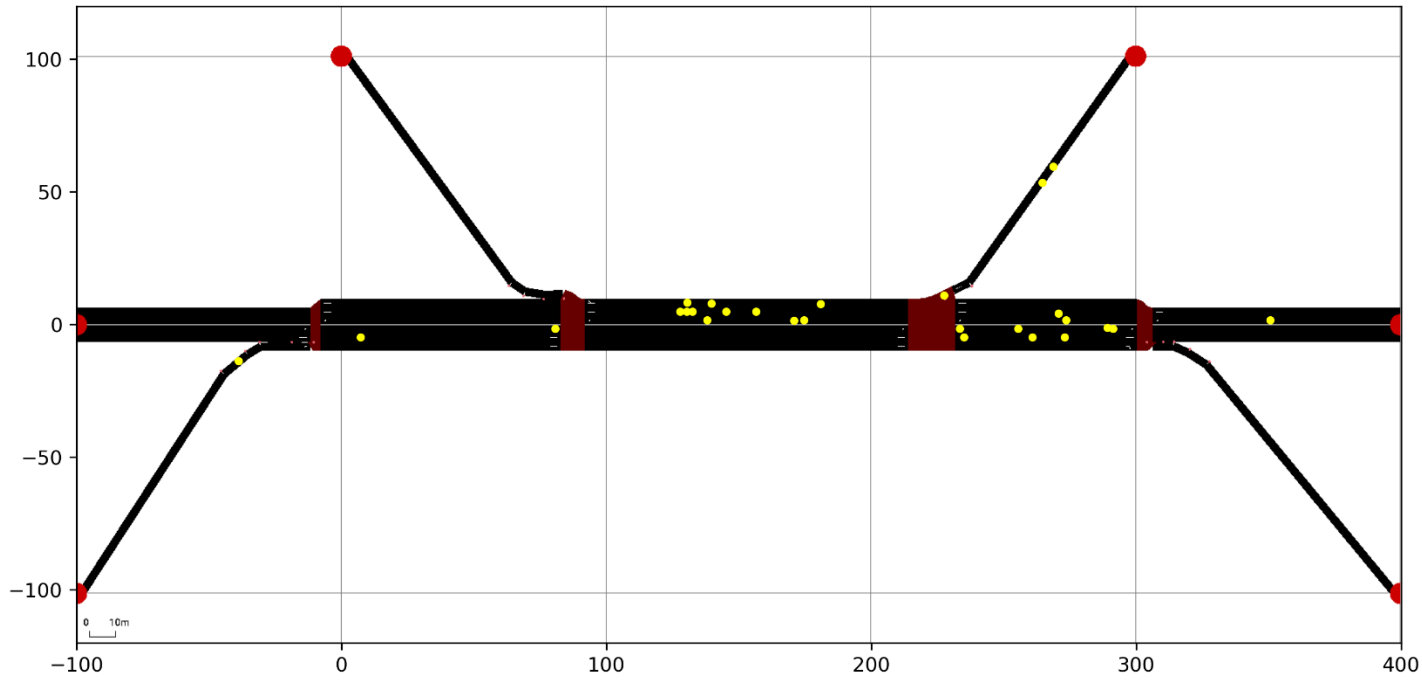
Using Hist2d plot:



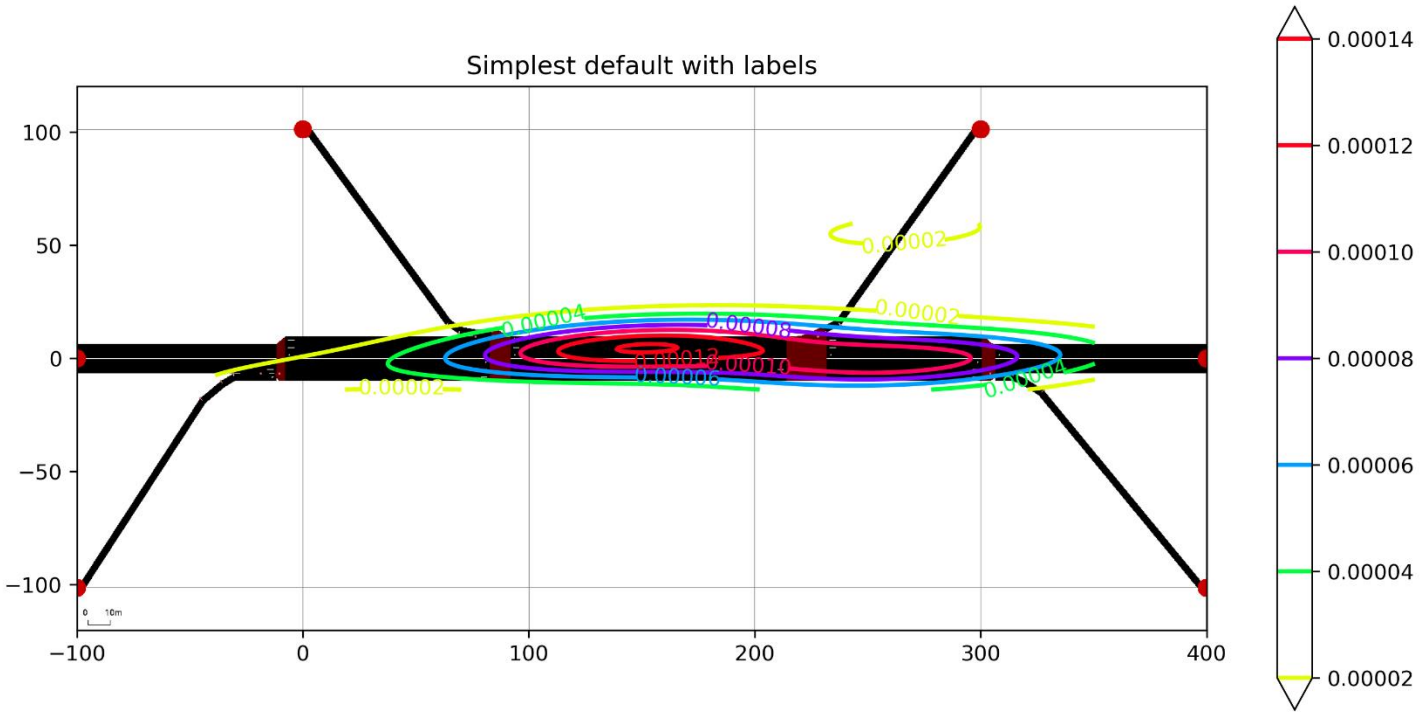
Using hexbin plot:



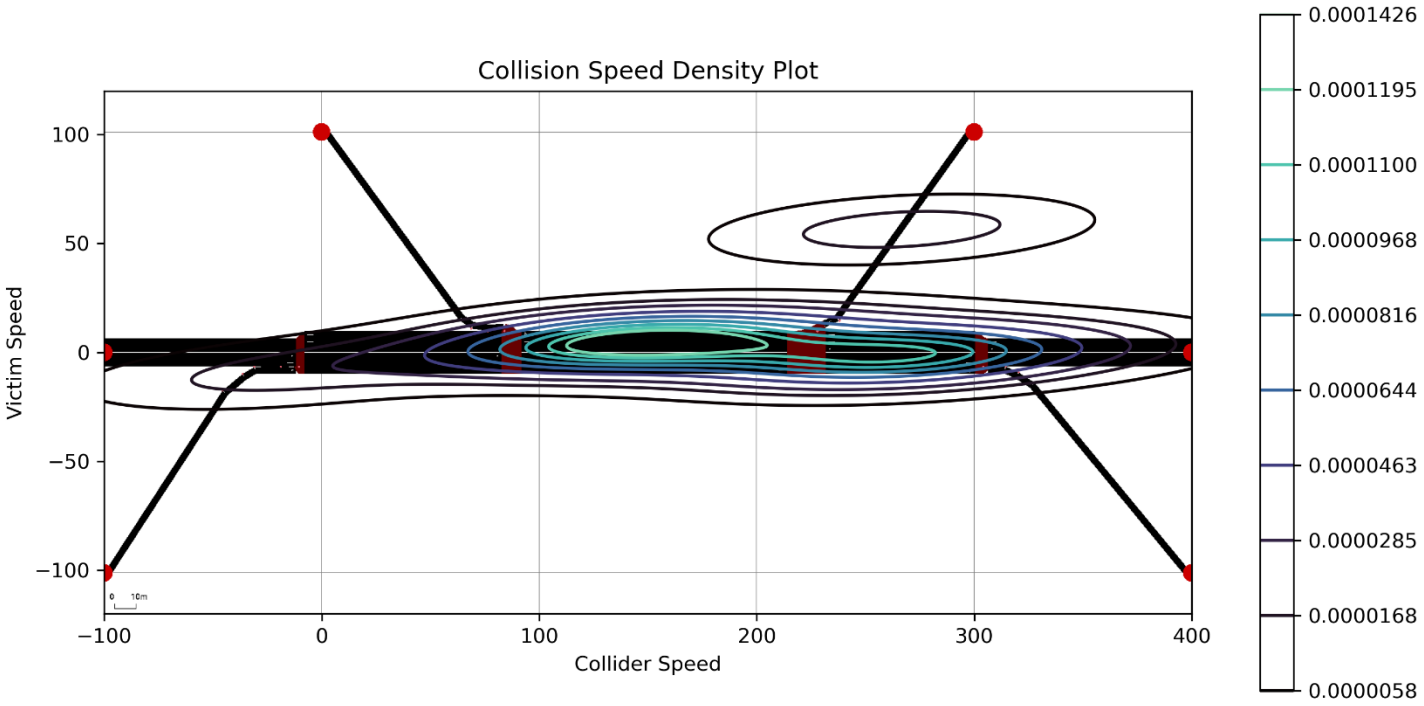
Using scatter Plot:



Using contour plot:

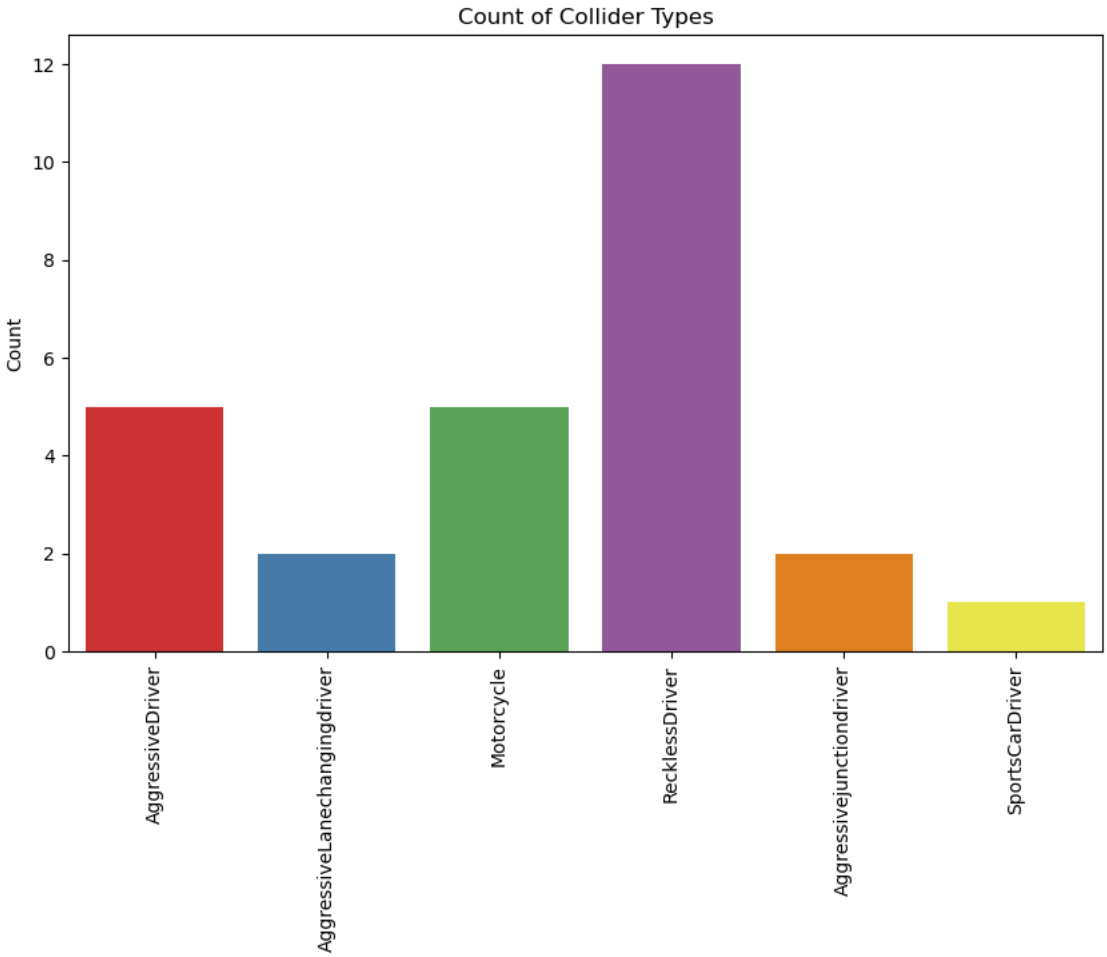


Using kdeplot :

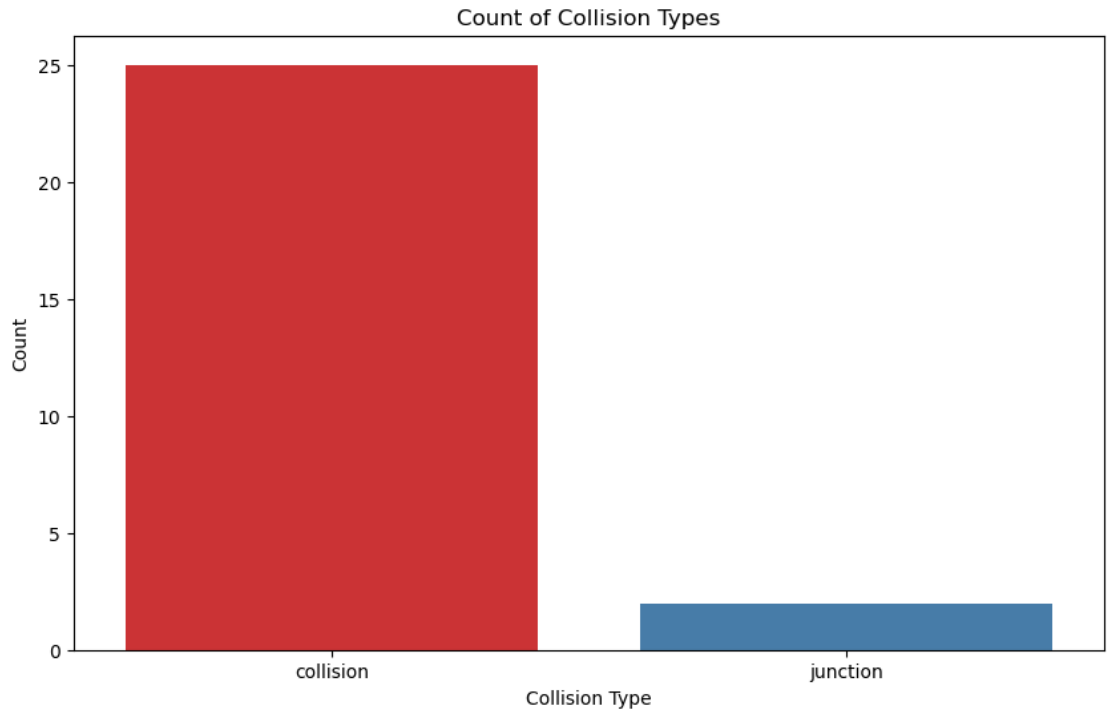


Collision Output Analysis:

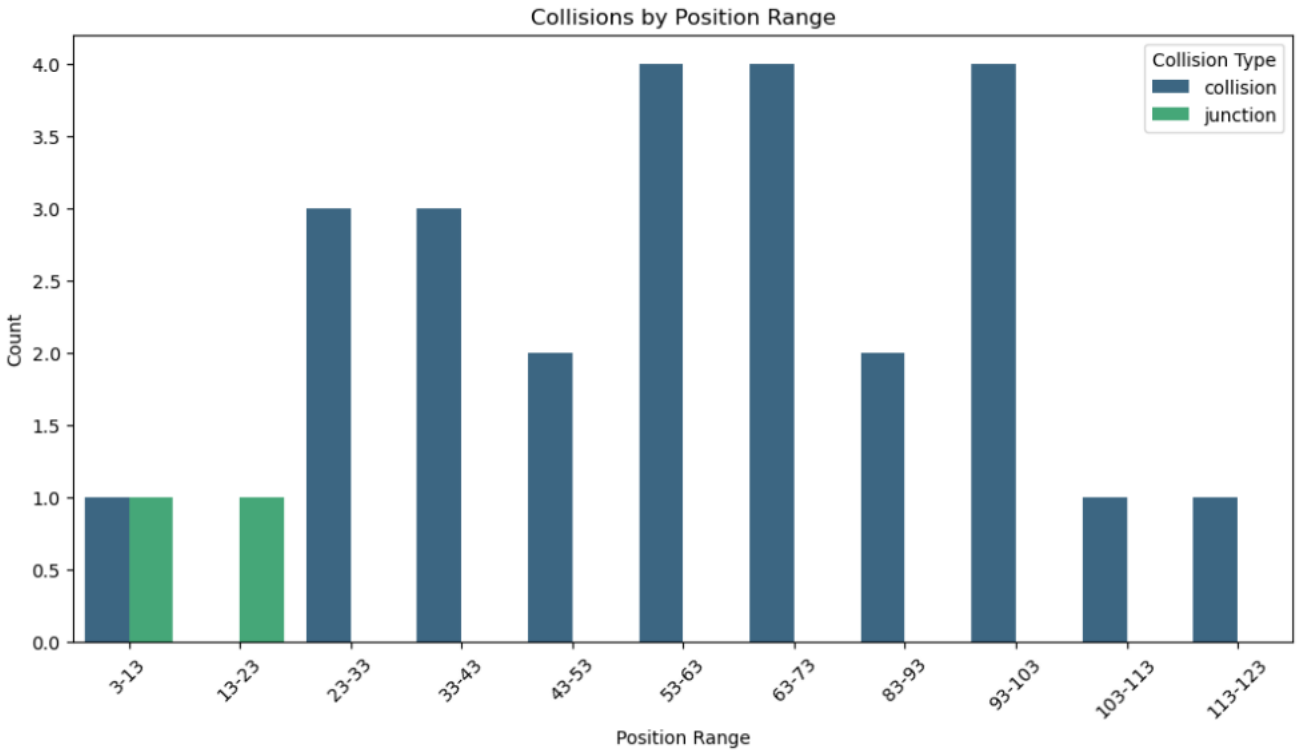
Count plot of Vehicle Types:



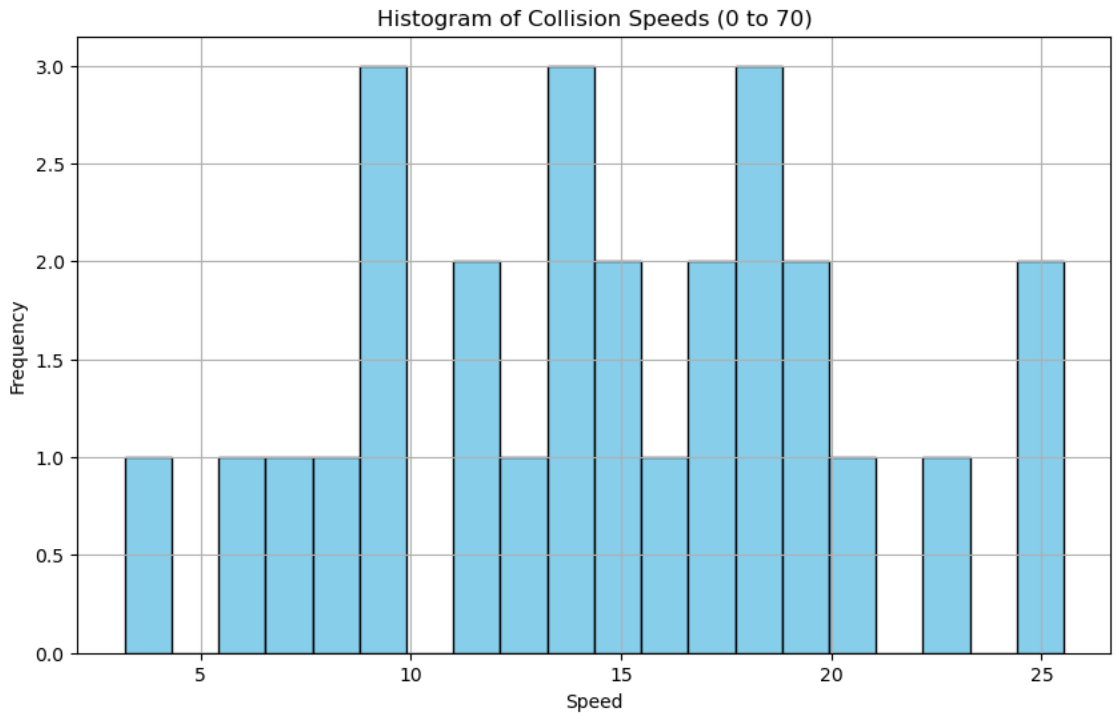
Count of Collision Types:



'Collisions by Position Range:



Histogram of Collision Speeds (0 to 70):



Collision Counts by Lane: